

Response Under 37 CFR 1.116
Expedited Procedure
Examining Group 1796
Application No. 10/559,965
Paper Dated: March 26, 2010
In Reply to USPTO Correspondence of November 4, 2009
Attorney Docket No. 5946-091619

REMARKS

Claims 1-9 and 12-32, 34-38 and 42 are currently pending in this application. Claims 10, 11, 33 and 39-41 have been cancelled, without prejudice to filing one or more divisional or continuation applications directed to the cancelled subject matter.

Claim 1 has been amended, without prejudice, to clarify that, in some embodiments, in the second polymerization in the second reactor, the polymerized olefins are further polymerized in a fluidized bed and in a moving bed by settled polymeric particles moving downwardly in a more or less plug stream under such conditions that the residence time in the fluidized bed and the residence time in the moving bed are independently controlled, wherein the residence time in the moving bed is controlled by controlling the outflow rate of particles from the moving bed. Claim 23 has been amended, without prejudice, to clarify that, in some embodiments, the outlet of the moving bed unit is provided with control means for controlling the outflow rate of particles from the moving bed unit. Claim 42 has been added to clarify that, in some embodiments, the control means is a valve. These amendments are supported at least at page 14, lines 4-15 of the specification. No new matter has been added to the application by the foregoing amendments.

35 U.S.C. §112, second paragraph rejection of claims 23-38

At pages 2-3 of the Office Action, claims 23-38 have been rejected under 35 U.S.C. §112, second paragraph, for indefiniteness. The Examiner contends that in claim 23 (line 12); the phrase “means for controlling” is an attempt to use a “means” clause to recite a claim element as a means for performing a specified function. However, the Examiner contends, since no function is specified by the word(s) preceding “means,” allegedly it is impossible to determine the equivalents of the element, as required by 35 U.S.C. §112, sixth paragraph. The Examiner makes a similar rejection of claim 27 (line 2), for the phrase “means for removing” and claim 27 (line 3), for the phrase “means for separating”.

Applicants respectfully traverse this rejection and request that the rejection be reconsidered and withdrawn.

The Examiner’s focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. §112, second paragraph, is whether the claim meets

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the threshold requirements of clarity and precision. M.P.E.P. §2173.02. The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Id. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

Id.

While Applicants respectfully disagree with the reasons for rejection, to expedite allowance of the claims Applicants have amended claim 23 to clarify that the means is a “control means”. With respect to claim 27, the “means for removing” is preceded by the word “removal”, and the “means for separating” is preceded by the word “separating”. The removal means and separating means are therefore clear to one of ordinary skill in the art.

Therefore, one of ordinary skill in the art would readily understand the meaning of the terms and phrases discussed above as used in the present specification and claims, in view of the disclosure of the specification discussed above coupled with the knowledge of one of ordinary skill in the art at the time of invention, as exemplified above.

Accordingly, Applicants respectfully request that the §112, second paragraph, rejections for indefiniteness discussed above be reconsidered and withdrawn.

§103(a) rejection of claims 1-9, 12-32, 34-38 over Harlin et al. in view of Mutsers et al.

Claims 1-9, 12-32, 34-38 have been rejected under 35 U.S.C. §103(a) as being obvious over Harlin et al. (U.S. Patent No. 6,469,110) in view of Mutsers et al. (WO 02/41 986 A1). The Office Action contends that Harlin et al. (Figure 1) discloses a polymerization process for preparing polypropylene in a reactor system comprising pluralities of reactors. Harlin et al. (column 11, lines 17-48) allegedly indicates that their polymerization process comprises a pre-polymerization reactor (1), a first loop reactor (40), and a second gas phase (fluidized bed) reactor (60). According to the Office Action, Harlin et al. (column 16, claim 24) teaches that a third gas phase reactor can be installed. Regarding the polymerization

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temperature and pressure requirements of claims 4, 7, Harlin et al. (column, 8 lines 48-65) allegedly teach the polymerization temperature of from 40 to 110°C and the pressure of 30 to 100 bar, which allegedly meet the requirements as claimed. Regarding the claimed “liquid phase” of claim 3 and the “propane” of claim 6, the Office Action contends that Harlin et al. (column 5, lines 62-64) clearly teach the use of propane as a medium. Regarding claims 8 and 9, the Office Action contends that Harlin et al. (column 11, line 33, item 50) clearly disclose the presence of a flash separator for removing hydrocarbons and/or hydrogen, which are present in the reactor (column 8, lines 35-40).

The Office Action argues that in view of the allegedly substantially identical processing condition, reactants, and apparatus disclosed in Harlin et al., the Office Action has a reasonable basis to believe that the claimed “the loop reactor is adapted to work under supercritical conditions” is inherently possessed in Harlin et al. The Office Action contends that the rationale set forth for the instant rejection is adequate since claim 25 fails to set forth any conditions or features that are required for running the polymerization process under supercritical conditions.

Regarding the claimed feature “the residence time in the moving bed is controlled by controlling the outflow rate of particles from the moving bed”, the Office Action argues that in view of the substantially identical reactors disclosed in Harlin et al., he has a reasonable basis to conclude that the apparatus disclosed by Harlin et al. inherently possesses the claimed feature. The Office Action contends that Applicants must recognize that the apparatus comprises conduits that transfer from one reactor to the next reactor, therefore it would not be difficult for one of ordinary skill in art to conclude that transferring of mass from one reactor to the next would associate a change or a control on residence time. The Office Action notes that since the PTO does not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise.

The Office Action acknowledges that the difference between the claimed invention and the process of Harlin et al. is that Harlin et al. does not teach a process involving a second reactor comprising a moving bed under such conditions that the residence time in the fluidized bed and the residence time in the moving bed are independently controlled.

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The Office Action refers to Mutsers et al. (abstract) as disclosing a polymerization process wherein a fluidized bed reactor comprises a reaction chamber 4, and a reactor 2 which comprises one or more connecting pipes (10) running outside the reactor chamber 4. Regarding the claimed “independently control” feature, the Office Action contends that Mutsers et al. (page 10, claims 1, 2, 4) discloses one or more connecting pipes running outside, where the cross-section ratio of the pipes to the reactor’s cross-section can vary from 0.1 to 1.0, the angle can vary between 0 to 60 degree. Allegedly motivated by the expectation of success of introducing fresh monomer at the connection of the connecting pipes to the wall of the top part of the reactor chamber or to the wall of the outlet section (page 4, line 1.5), the Office Action argues that it would have been obvious to one of ordinary skill in art to replace the fluidized bed reactor of Harlin et al. with the fluidized bed reactor of Mutsers et al. to obtain a fluidized bed reactor having a “moving bed” as claimed. In view of Applicants’ specification (page 9, lines 15-24) which states the requirement on how “independent control” can be achieved, the Office Action alleges that he has a reasonable basis to conclude that the teachings of Mutsers et al. have adequately taught the means for the claimed “independent control” feature. Although Applicants’ specification (figures 2 and 3) indicates some specific features, such as inlet and nozzles installed in the moving bed for the purpose of “independent control”, the Office Action notes that features described in the specification can not be read into the claims.

The Office Action further asserts, with regard to claims 12-18, 21 which contain process related features, such as “condensed mode”, “a separation fluidum”, “the residence time in the moving bed is independently controlled”, and “the residence time in the moving bed is controlling by controlling the outflow rate of particles from the moving bed”, that Harlin et al. clearly teach a process and apparatus that are substantially identical to the one as claimed, therefore the Examiner allegedly has a reasonable basis to assert that any minor variation of such teachings is considered obvious because motivated by the expectation of success of obtaining the polymerization process of Harlin et al., it would have been obvious to one of ordinary skill in art to vary the process of Harlin et al. to obtain the features of claims 10-18, and 21.

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Applicants respectfully traverse this rejection and request that the rejection be reconsidered and withdrawn.

As reiterated by the Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. ___, 82 U.S.P.Q.2d 1385 (2007), the framework for the objective analysis for determining obviousness under 35 U.S.C. §103 is stated in *Graham v. John Deere*. Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in KSR International Co. v. Teleflex Inc., 72 Fed. Reg., No. 195 (October 10, 2007) at page 57527 (hereinafter “Examination Guidelines”). The factual inquiries enunciated by the Court are as follows:

- (1) Determining the scope and content of the prior art;
- (2) Ascertaining the differences between the claimed invention and the prior art; and
- (3) Resolving the level of ordinary skill in the pertinent art.

Examination Guidelines at page 57527.

Present claim 1, as amended, relates to a process for the catalytic polymerization of olefins comprising the steps of: i) a first polymerization in a first reactor, wherein olefins are polymerized with a particulate catalyst, hydrogen and optional a comonomer in a fluidum of an inert low boiling hydrocarbon medium into an reaction mixture comprising polymerized olefins; and ii) a second polymerization in a second reactor, wherein the polymerized olefins are further polymerized in a fluidized bed and in a moving bed by settled polymeric particles moving downwardly in a more or less plug stream under such conditions that the residence time in the fluidized bed and the residence time in the moving bed are independently controlled, wherein the residence time in the moving bed is controlled by controlling the outflow rate of particles from the moving bed.

Harlin et al. discloses a process and apparatus for polymerizing propylene, having at least one slurry reactor and at least one gas phase reactor (Abstract). *The Office Action acknowledges that Harlin et al. does not disclose a process involving a second reactor comprising a moving bed under such conditions that the residence time in the fluidized bed and the residence time in the moving bed are independently controlled.*

Mutsers discloses a fluidized bed reactor having one or more connecting pipes running outside the reaction chamber and connecting the bottom part of the reaction chamber

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with the top section thereof and/or with the outlet section of the fluidized bed reactor (Abstract). The disclosure of Mutsers does not cure the above deficiencies in the disclosure of Harlin et al.

In contrast to the presently claimed invention, Mutsers does not suggest or disclose that the connecting pipe (10) of Mutsers would operate by settled polymeric particles moving downwardly in a more or less plug stream, as specified in present claim 1. Further, Mutsers does not suggest or disclose that the residence time of the polymer in connecting pipe (10) would be independently controlled from that of the polymer within the fluidized bed (4).

Mutsers does not disclose whether the polymer enters the pipe (10) from the top opening (16) or the bottom opening (12). If the polymer entered through the bottom opening (12) and exited through the top opening (16), then there would not be a settled bed but either a fluidized bed or a fast fluidized bed in pipe (10). And even if the polymer entered the pipe (10) through the top opening (16) and exited through the bottom opening (12), it appears that some gas would enter the pipe (10) through the bottom opening (12) and this would be likely to cause the polymer in pipe (10) to be in a fluidized state and not in a settled state.

Furthermore, Musters does not suggest or disclose controlling the outflow of particles from the connecting pipe (10), as specified in independent claims 1 and 23. Please note the text on page 5, lines 25-33 of Mutsers, which discloses that the upper opening is preferably smaller than the lower opening. Therefore, if the polymer present in the connecting pipe of Musters formed a settled bed (which is not conceded), then there would not be any control of the outflow. The inflow of polymer into the pipe (10) could be controlled by flushing with monomer (33).

Therefore, even if the disclosure of Harlin et al. was combined with the disclosure of Musters as set forth in the Office Action, the combination does not suggest or disclose a moving bed, that the residence time of the polymer in the fluidized bed would be independently controlled from that of the polymer within the moving bed, controlling the outflow rate of particles from the moving bed, or settled polymeric particles moving downwardly in a more or less plug stream, as specified in independent claims 1 and 23.

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Accordingly, since Harlin et al., further in view of Mutsers, combined as set forth in the Office Action, fails to suggest or disclose at least one element of independent claims 1 and 23, the cited combination of Harlin et al., further in view of Mutsers, does not obviate these claims. Applicants respectfully request reconsideration and withdrawal of the §103 rejection of claims 1-9, 12-32, 34-38 over the disclosures of Harlin et al., further in view of Mutsers, combined as set forth in the Office Action.

Conclusion

It is believed that any pending objections and rejections have been addressed. However, the absence of a reply to a specific rejection, issue, or comment does not signify agreement with or concession of that rejection, issue, or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Applicants submit that the pending claims are in condition for allowance, which action is requested. The Examiner is invited to contact the undersigned directly at 412-227-3061 with any questions.

Respectfully submitted,

THE WEBB LAW FIRM

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By



Ann M. Cannon

Registration No. 35,972

Attorney for Applicants

436 Seventh Avenue

700 Koppers Building

Pittsburgh, PA 15219

Telephone: (412) 471-8815

Facsimile: (412) 471-4094

E-mail: webblaw@webblaw.com